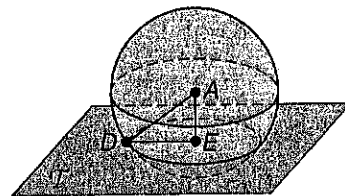


12-7

Skills Practice

Surface Areas of Spheres

In the figure, A is the center of the sphere, and plane T intersects the sphere in circle E . Round to the nearest tenth if necessary.



1. If $AE = 5$ and $DE = 12$, find AD .

$$13 \quad \text{pyth.}$$

2. If $AE = 7$ and $DE = 15$, find AD .

$$\begin{array}{r} 149 \\ 225 \\ \hline 274 \end{array} \quad \sqrt{274} \approx 16.6$$

3. If the radius of the sphere is 18 units and the radius of $\odot E$ is 17 units, find AE .

$$\begin{array}{r} 324 \\ -289 \\ \hline 35 \end{array} \quad \sqrt{35} \approx 5.9$$

4. If the radius of the sphere is 10 units and the radius of $\odot E$ is 9 units, find AE .

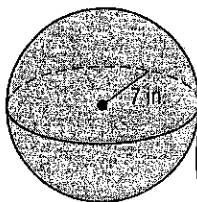
$$\begin{array}{r} 100 \\ -81 \\ \hline 19 \end{array} \quad \sqrt{19} \approx 4.4$$

5. If M is a point on $\odot E$ and $AD = 23$, find AM .

$$23$$

Find the surface area of each sphere or hemisphere. Round to the nearest tenth.

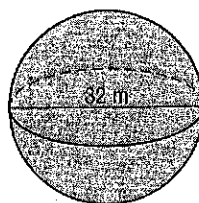
6.



$$4\pi 7^2$$

$$196\pi \approx 615.8 \text{ m}^2$$

7.



$$4\pi 16^2$$

$$1024\pi \approx 3217.0 \text{ m}^2$$

8. a hemisphere with a radius of the great circle 8 yards

$$\frac{1}{2} 4\pi 8^2$$

$$128\pi + 64\pi = 192\pi \approx 603.2 \text{ yd}^2$$

9. a hemisphere with a radius of the great circle 2.5 millimeters

$$\frac{1}{2} 4\pi (2.5)^2 + (2.5)^2 \pi$$

$$12.5\pi + 6.25\pi = 18.75\pi \approx 58.9 \text{ mm}^2$$

10. a sphere with the area of a great circle 28.6 inches

$$4\pi (3.02)^2$$

$$(28.6) = \pi r^2 \quad 3.02 = r$$

$$\text{OR } 4 \times 28.6$$

13-3 Skills Practice**Volumes of Spheres**

Find the volume of each sphere or hemisphere. Round to the nearest tenth.

1. The radius of the sphere is 9 centimeters.

$$\frac{4}{3}\pi 9^3 \quad 972\pi \approx 3053.6 \text{ cm}^3$$

2. The diameter of the sphere is 10 inches.

$$\frac{4}{3}\pi 5^3 \quad 166\frac{2}{3}\pi \approx 523.6 \text{ in}^3$$

3. The circumference of the sphere is 26 meters.

$$26 = \pi d \quad \frac{4}{3}\pi r^3 \quad 94.5\pi \approx 296.8 \text{ m}^3$$

$$4.14 = r$$

4. The radius of the hemisphere is 7 feet.

$$\frac{1}{2} \cdot \frac{4}{3}\pi 7^3 \quad 228\frac{2}{3}\pi \approx 718.4 \text{ ft}^3$$

5. The diameter of the hemisphere is 12 kilometers.

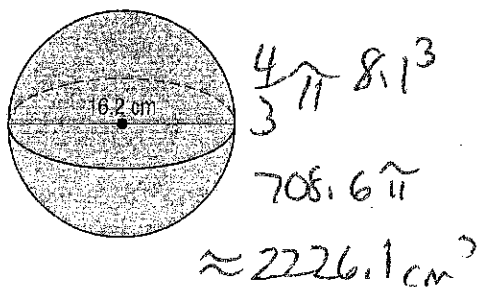
$$\frac{1}{2} \cdot \frac{4}{3}\pi 6^3 \quad 144\pi \approx 452.4 \text{ km}^3$$

6. The circumference of the hemisphere is 48 yards.

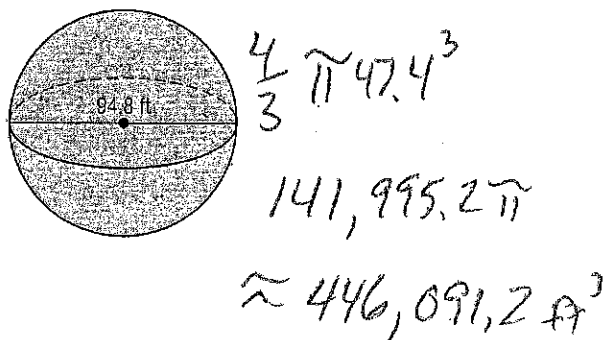
$$48 = \pi d \quad \frac{1}{2} \cdot \frac{4}{3}\pi (7.64)^3 \quad 297.2\pi \approx 933.8 \text{ yd}^3$$

$$7.64 = r$$

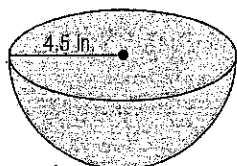
7.



8.



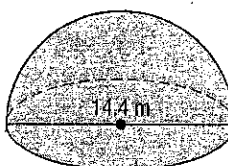
9.



$$\frac{1}{2} \cdot \frac{4}{3}\pi 4.5^3$$

$$60.8\pi \approx 190.9 \text{ in}^3$$

10.



$$\frac{1}{2} \cdot \frac{4}{3}\pi 7.2^3$$

$$248.8\pi \approx 781.7 \text{ m}^3$$

Spheres

1. Find the radius and volume of a sphere with an area of
- 200π
- .

$$\frac{200\pi}{4\pi} = \frac{4\pi r^2}{4\pi}$$

$$50 = r^2$$

$$r = 5\sqrt{2} \text{ m}$$

$$V = \frac{4}{3}\pi (5\sqrt{2})^3$$

$$476.4\pi$$

$$1481.0 \text{ m}^3$$

2. Find the radius and area of a sphere with a volume of
- 288π
- .

$$288\pi = \frac{4}{3}\pi r^3$$

$$A = 4\pi 6^2$$

$$\frac{3}{4}(288 = \frac{4}{3}\pi r^3)$$

$$216 = r^3$$

$$r = 6 \text{ m}$$

$$144\pi \approx 452.4 \text{ m}^2$$

3. Find the radius and area of a sphere with a volume of
- 256π
- .

$$256\pi = 4\pi r^3$$

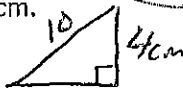
$$64 = r^3$$

$$8 = r$$

$$V = \frac{4}{3}\pi 8^3$$

$$682\frac{2}{3}\pi \approx 2144.7 \text{ m}^3$$

4. Find the area the circle formed when a plane passes 4cm from the center of a sphere with a radius of 10cm.

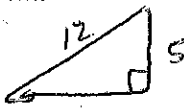


$$100 = 16 + r^2$$

$$84 = r^2$$

$$A = 84\pi \text{ cm}^2$$

5. Find the area the circle formed when a plane passes 5cm from the center of a sphere with a radius of 12cm.



$$12^2 = 5^2 + r^2$$

$$119 = r^2$$

$$A = 119\pi \text{ cm}^2$$

6. A water storage tank consists of a cylinder capped with a hemisphere. Find the volume of the tank.

$$V_{\text{cylinder}} = 9\pi \cdot 16 = 144\pi$$

$$V_{\text{hemis}} = \frac{1}{2} \cdot \frac{4}{3}\pi 3^3 = 18\pi$$

$$162\pi$$

$$162\pi \approx 508.9 \text{ m}^3$$

7. Find the volume of a sphere with an area of
- 36π
- .

$$A = 4\pi r^2$$

$$36\pi = 4\pi r^2$$

$$9 = r^2$$

$$3 = r$$

$$V = \frac{4}{3}\pi 3^3$$

$$36\pi \approx 113.1 \text{ m}^3$$

